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Eucisia schist a natural stone from Northern Portugal

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The aim of this work was to study the “Xisto” (Portuguese word for “schist”, lato sensum) as geological resource of Trás-os-Montes and Alto Douro (TMAD) region, by its economic and social impact.
The main outcome of this contribution is to improve the knowledge about mineralogy, fabric, chemistry and technology of the “Eucisia schist”, belonging to "Douro Group”- Variscan basement. in order to promote its exploitation and use as a natural stone.
The Trás-os-Montes and Alto Douro (TMAD) region is located in the NW sector of the Hesperian Massif of the Variscan Chain. The studied site is geologically located in Central Iberian Zone (CIZ) corresponding to an Autochthonous terrain during Variscan orogeny, [1, 2 and 3].
The Variscan basement was structured by three sucessive phases of Variscan deformation: D1, D2 and D3. In CIZ only D1 and D3 are represented.
The metamorphic evolution of the NW of Hesperian Massif is characterized by a syn-D2 regional orogenic metamorphism of Barrovian type which changed to high temperature and low pressure between D2 and D3 phases.
“Eucisia schist” is a stone with very fine grain, gray colour with a brownish to greenish patine, a well-marked foliation, generally parallel to the stratification and a metamorphism of low grade (greenschist facies). “Eucisia schist” under petrographic and geochemical studies corresponds to a phyllite with chlorite. The content of major elements, particularly $Al2O_3$ and trace elements such as V, discriminate the relative abundance of pelitic component on the rock. Higher values of $Al2O_3$ (19.66%) and V (105ppm) correspond to a significant involvement of a clay matrix.
The physical and mechanical tests as compressive strength (CS), flexural strength (FS), apparent density (AD), open porosity (OP), water absorption (WA), abrasion resistance (AR) and resistance to ageing by thermal shock (RTS) were determinant to define the suitable applications of studied phyllite. The results concerning the studied stone are: CS 53 Mpa, FS 16.3 MPa, AD 25220 kg/m3 , OP 9.3%, WA 1,2 % AR 26.0mm and RTS resistant.
For settling the recommended applications, European standards for natural stone products were considered. Considering the technical specifications that exist in some European countries, “Eucisia schist” can be applied on rustic masonary units, on colums, on paving (low traffic, mainly indoors) and on cladding (mainly indoors).

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